Overview of Pepco Undergrounding Study

December 19, 2012

Agenda

Review Selection Criteria

Discuss Results of the Study

 Discuss the Impacts of the Different Undergrounding Options

Identify Open Issues and Next Steps

Feeder Ranking Options

Cost and Reliability Analysis Model Evaluates 32 Months of Actual Outage data

Outage Frequency (SAIFI) Outage Duration (SAIDI) Combination Frequency & Duration (SAIFI and SAIDI)

Improvement per Dollar spent Combined Reliability and Cost

Work Plan

Ranking by frequency and duration combination ensures that the feeder selections will be addressing the feeders with a combined highest overall reliability improvement and achieve the highest cost per customer minute interruptions benefit

- Using the five different ranking methods just discussed one method must be selected to rank all feeders in priority order.
- This chart shows that ranking by SAIDI produces the highest benefit
- The report includes charts that demonstrate how the ranking of feeders will vary between each of these methods

Ranking comparison as a % of the maximum available value						
	Customer Interruption reduction	Customer Minutes of Interruption reduction	Customer Value Of Service	Total		
SAIFI	100%	76%	65%	242%		
SAIDI	87%	100%	94%	281%		
SAIFISAIDI	96%	88%	70%	254%		
CMI/\$	86%	96%	75%	257%		
Combined weighted	88%	82%	100%	270%		

Highest benefits

- Selection criteria is reviewed annually and can result in different ranking of feeders.
- Chart demonstrates that regardless of which criteria used there are feeders that are ranked high in all 5 scenarios.
- Recommendation could be to establish a process where feeders can be quickly selected for the first phase of the undergrounding programing.
- This recommendation would identify the areas and feeders to start undergrounding, with approval of the Task Force, and provides time to further evaluate the most appropriate selection criteria to develop longer term multiyear plan
- Feeders that are cross jurisdictional (serve both MD and District customers) would be evaluated during the design phase to identify opportunities to move MD customers to other MD feeders.

Feeder	SAIFI	SAIDI	SAIDISAIFI	CMI/\$	Combined	Total
14007	х	х	Х	х	Х	5
14136	х	х	Х	Х	Х	5
14758	х	х	Х	х	Х	5
14769	х	х	Х	х	Х	5
14890	х	х	Х	Х	Х	5
15199	х	х	Х	Х	Х	5
15707	х	х	Х	х	Х	5
15801	х	х	Х	Х	Х	5
15943		х	Х	Х	Х	4
14703		х	Х	х		3
14767		х		х	Х	3
15166	х	х		х		3
15701		х	Х	Х		3
15705	х		Х		Х	3
14717	х		Х			2
14766		х		х		2
14896	х		Х			2
15264		х		х		2
14023					Х	1
14093					Х	1
14768					Х	1
14891		Х				1
15172	Х					1
15174	Х					1

Once a prioritization of feeders has been established you then have to determine what portions of the feeder would be undergrounded. This table shows from a total system view the difference in cost and benefits produced for each option

Results for All Outages as a Percentage of Total

District of Columbia (All Outages Percent of total)	Cost (\$Billions)	Outage Events	Customer Frequency	Customer Duration
1. UG main line w/OH secondary	\$1.96	4%	32%	31%
2. UG laterals w/UG secondary	\$3.38	63%	26%	37%
3. UG main line and laterals w/OH secondary	\$3.08	44%	57%	62%
4. UG main line and laterals w/UG secondary	\$5.21	67%	58%	68%

Results for All Outages as a Percentage of overhead outages

District of Columbia (All Outages Percent of overhead)	Cost (\$Billions)	Outage Events	Customer Frequency	Customer Duration
1. UG main line w/OH secondary	\$1.96	6%	55%	46%
2. UG laterals w/UG secondary	\$3.38	94%	45%	54%
3. UG main line and laterals w/OH secondary	\$3.08	65%	97%	92%
4. UG main line and laterals w/UG secondary	\$5.21	100%	100%	100%

Using the option to underground all of the primary and retain the secondary overheard what are some of the impacts?

 Selection of undergrounding of primary but not the secondary reduces cost from \$5.21 billion to \$3.08 billion and still achieves the majority of the reliability benefits – 65% fewer outages, 97% improvement in frequency and 92% reduction in duration of outages

Retaining secondary and services overhead retains the need for poles and

therefore no driver to underground communication lines

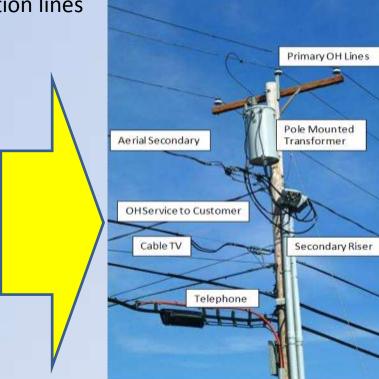
 Avoids the cost and inconvenience of replacing the service drop to customers homes.

What is removed

Primary OH Lines
Pole Mounted transformer

What remains

Aerial Secondary
OH Service to Customer
Cable TV
Telephone
Secondary Riser



Ranking and Selection Process

1

Ranking Of Feeders By Selected Criteria

Ranking feeders using a combination of the individual contribution of feeder SAIFI and SAIDI to system reliability using an equal weighting to identify which portion of feeder to underground.

6

Construction Of Underground Lines

Begin construction



Consider Reliability Enhancement Programs Already Being Performed

REP measures (such as, Vegetation Management, Feeder Improvement and Selective Undergrounding) that may already have improved the feeder performance.

5

Begin Planning And Design

Carry out field engineering, planning and design.



Consider Future Economic And Infrastructure Developments In The Feeder Area

Schedule of road construction projects and the ability to coordinate planned infrastructure construction work with undergrounding projects.

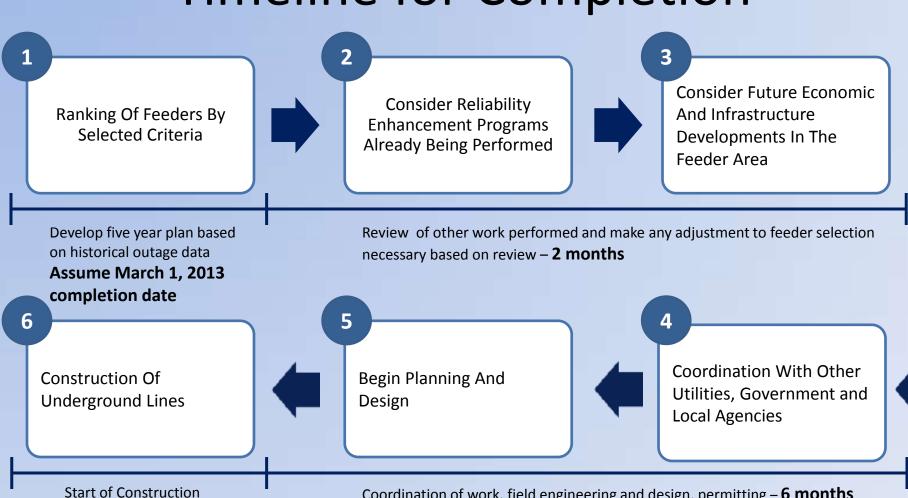
Coordination With Other Utilities, Government and Local Agencies

Coordinate work, meet with local government officials, community organizations and apply for permitting



Government of the District of Columbia
Vincent C. Gray, Mayor

Timeline for Completion



Government of the District of Columbia
Vincent C. Gray, Mayor

January 1, 2014

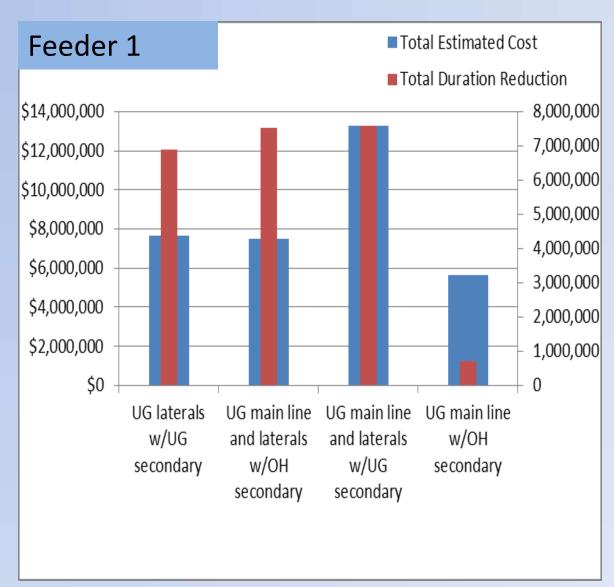
Coordination of work, field engineering and design, permitting – **6 months**Bidding and award of project and crew mobilization – **2 months**

MAYOR'S POWER LINE UNDERGROUNDING TASK FORCE LEGISLATIVE AND GOVERNMENT AFFAIRS COMMITTEE

This chart demonstrates that each feeder needs to be evaluated during the design phase to identify the ultimate recommendation

For this feeder similar cost and benefits can be achieve by undergrounding the laterals and secondary's as compared to undergrounding all of the primary but not the secondary's

The selection model developed by Pepco provides the ability to identify which feeders will produce the greatest benefits from undergrounding



Open Issues and Next Steps

- Technical committee will continue to review the report and address any questions from its members
- A process needs to be developed to continue to obtain stakeholder input and review of future undergrounding plans
- Are changes needed to existing regulations to require the installation of new or replacement overhead facilities to be underground
- Is the Task Force looking for a phased recommendation where initial areas for undergrounding can be identified and a process established to identify multiyear plan